3-8 Problem-Solving Strategy: Reason Logically

Read Plan Solve Check

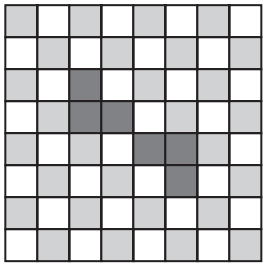
Name _____ Date _____

Reason logically to solve each problem.

1. A container holds 12 red balls and 4 blue balls. You may *double* the number of balls in the container at any time (by adding more red and blue balls), but you may never *remove* any balls). In this manner, can you reduce the percent of red balls to 20%? Explain.

2. Is there a two-digit number with the property that, when the tens and ones digits are reversed, the resulting number is three times the value of the original?

3. You can perfectly cover an ordinary 8-by-8 checkerboard with 32 of these tiles,  . In the given checkerboard, six squares are missing. Can you cover this board using the same tiles? Explain.



4. Can you cover the checkerboard shown above with tiles shaped like this  ? Explain.

5. Two digits are missing from this number: 3,481_,62_,728. Could this number be a square number? Explain.

6. For what missing digit N would the following number be evenly divisible by 9? Explain.

23,018,142,N12,531,212

7. Is there a three-digit number x with the property that, if any one of its digits is removed to form a two-digit number y, then x is twice y. Explain.

8. Find all possible numbers that follow this rule: When removing the first digit of a three-digit number x, the two-digit number y is one-fifth x. Explain.

9. Show that $7.\overline{9}$ (or, 7.999 . . .) is equal to 8.

10. When a particular integer is divided by 12, the remainder is 7. Find the sum of the remainders when this number is divided by 3, 4, and 6.

11. Good'n'Sweet sells 79,000 jars of marmalade over the course of 5 days. Each day 2000 more jars were sold than on the previous day. How many jars were sold on day 4?